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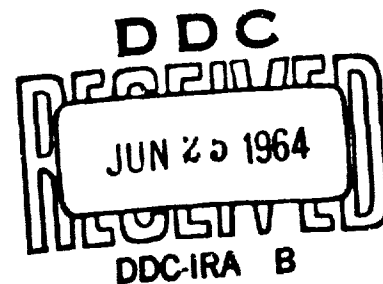
Technical Note N-596

POLAR STRUCTURES - SPECIFICATIONS FOR THE NCKL WANIGANS

BY

G. E. Sherwood

11 June 1964



U. S. NAVAL CIVIL ENGINEERING LABORATORY
Port Hueneme, California

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POLAR STRUCTURES - SPECIFICATIONS FOR THE NCEL WANIGANS

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Type C

by

G. E. Sherwood

ABSTRACT

A family of wanigans was developed to provide portable shelters for use in polar regions. These wanigans are of two types: sled wanigans are mounted on cargo sleds for trail use; portable camp wanigans are built with a skid system for limited movement around a camp or work area. All of the wanigans are 20 feet long and 8 feet high. Both types are made in standard 8-foot widths for assembled air shipment, and in extra-wide 10-foot widths for flexibility in interior arrangement. Standard accessories for the wanigans are: a heating and ventilating system, an electrical harness, and a side-mounted fuel tank. This technical note contains the specifications for the NCEL wanigans presented in the Naval Civil Engineering Laboratory Technical Report R-309, "Polar Structures - NCEL Family of Wanigans."

Qualified requesters may obtain copies of this note from DDC

INTRODUCTION

Portable structures called wanigans were developed to house facilities for polar trail parties and transient polar camps or work areas. These wanigans are of modular sandwich panel construction. They are 20 feet long and 8 feet high. Sled wanigans are mounted on sleds for trail use. Portable wanigans are built on a skid system for movement around a camp or work area. Both types are made in standard 8-foot widths for assembled air shipment, and in extra-wide 10-foot widths which permit better interior arrangement. Accessories for the wanigans include a heating and ventilating system, an electrical harness, and a side-mounted fuel tank.

This technical note contains the specifications for the NCEL family of wanigans which are presented in Laboratory Technical Report R-309, "Polar Structures - NCEL Family of Wanigans." Standard specifications referenced in the text are listed in Appendix A.

DESCRIPTION OF WANIGAN COMPONENTS

The NCEL family of wanigans and their standard accessories are detailed in the drawings contained in Appendix B. The major components of the wanigans are:

1. Panels. All panels are 4 feet wide and 2 inches thick. They are constructed of wood framing with 1/4-inch plywood skin on both sides. The inside plywood has aluminum backing to serve as a vapor barrier, and the panels are insulated with 1-1/2-inch fiberglass blankets. Panels are bolted together through gasketed lap joints.
2. Portable Wanigan Floor. The portable wanigan floor is mounted on two steel skids. Timber cross members rest on the skids at 4-foot spacing and support the floor panels which are constructed of tongue and groove 2 by 6's. The wanigan walls are attached to a 2 by 8 frame around the perimeter of the building. The skid system is provided with a tongue which can be attached to either end for towing.
3. Heating and Ventilating System. Heat for the wanigan is

supplied by a 25,000 Btuh oil-fired space heater of the type commonly used in house trailers. A drip pan is provided under the heater, and a conventional vent pipe and roof jack are supplied. Copper tubing is used as a supply line from the fuel tank to the heater. An air intake blower is provided near the heater, and an air exhaust blower is provided as far as possible from the intake. Both blowers are mounted in fixtures with closures for adjusting the amount of fresh air and recirculated air.

4. **Electrical Harness.** The electrical harness provides general lighting and outlets for general purpose use. The fixtures and outlets are wired into a distribution panel. A house trailer-type connection is provided for connecting the distribution panel to the power source. No power source is included with the harness.

5. **Side-Mounted Fuel Tank.** The fuel tank is a special design for mounting on the sidewall of a wanigan. The mounting brackets match the bolts used for connecting panels together. The tank is 4 feet wide to conform to the building module, and only 8 inches thick so that it fits flat against the wanigan sidewall. The tank capacity is 80 gallons. It is provided with fittings for connecting a fuel line and for filling and draining the tank.

SPECIFICATIONS FOR THE WANIGANS

1. **Scope.** The work shall include the furnishing of all material and equipment, and performing all labor for the complete fabrication of the items indicated on the drawings and described and specified herein. The contractor's proposal shall be based on the drawings and specifications herewith and no deviations shall be accepted except as approved in writing by the Contracting Officer.

2. Materials

A. Wood

(1) **Lumber.** Kiln dried Douglas Fir, conforming to WCLA Grading Rules No. 15, Par. 183-b vertical grain for portable wanigan floor panels, and Par. 184-b flat grain for all other.

(2) **Plywood.** Plywood shall be Douglas Fir, exterior type, Grade AC with the A face on the outside of the panels, and shall conform to Specification MN-P-530a.

B. Steel

(1) **Sheet or Strip.** Conform to Specification QQ-S-640, PS-1020.

(2) Bar Stock. Conform to Specification QQ-S-633a.

(3) Structural. Conform to "Standard Specifications for Structural Steel for Bridges and Buildings," Serial Designation A-7 of the American Society for Testing Materials.

C. Aluminum

(1) Cladding for Plywood. The aluminum cladding shall be alloy 3003H14, .015 inch thick with mill finish, no backing, and raw edges.

D. Fastenings

(1) Nails. The nails shall be steel, cement coated, either standard or countersunk head and size as indicated on the drawings, and shall conform to Specification FF-N-105.

(2) Screws. Wood screws shall be steel, of the size and type indicated on the drawings and shall conform to Specification FF-S-111b.

(3) Bolts, Nuts, Washers.

(a) Bolts, carriage, square neck, and nuts. Conform to Type C-2, Table X, of Specification FF-B-571a and nuts Type A-1, Table XII.

(b) Bolts and nuts, hexagonal. Conform to Specification FF-B-571a, Type B-1, Table V and nuts Type A-1, Table XII.

(c) Washers. The washers shall be standard commercial cut steel of the type and size indicated on the drawings.

(d) Finishes. All bolts, nuts, and washers shall be finished with a zinc coating conforming to Type II or III, Class 2 of Specification QQ-Z-325a or cadmium plating Type II or III, Class 2 of Specification QQ-P-416a.

(4) Adhesive. The adhesive used for adhering wood to wood (other than the manufacture of plywood) shall be "room temperature resorcinol glue" (synthetic resin type) applied in accordance with manufacturer's instructions, and shall conform to MIL-A-397B.

E. Gaskets

(1) Panel Joints. Gaskets for joints shall conform to

Specification MIL-C-3133, Class BS, Grade 41.

F. Insulation

(1) Panels. Insulation shall be 1-1/2-inch-thick fiber-glass blanket with a density of 3/4 pound per cubic foot.

G. Coatings

(1) Galvanizing. Conform to Specification QQ-A-325a, Type II, Class I zinc coating.

(2) Cadmium Plating. Conform to Specification QQ-P-416a, Class I, Type II.

H. Paints

(1) Primer. The primer shall conform to Specification FF-P-636c.

(2) Enamel. The enamel shall conform to Specification FF-E-529a, Class A.

I. Hardware

(1) Hinges. Hinges shall conform to Specification FF-H-116c, Type 2171H.

(2) Door Latch Set. The door latch set shall be the type used in walk-in coolers. It shall be easily operated from either inside or outside the door by a person wearing polar-type mittens.

(3) Chain. All chain and chain attachments shall conform to Specification RR-C-271a.

J. Electrical Materials

(1) Miscellaneous. Materials listed below shall conform to specifications as noted:

Materials

Specification

(a) Wire connectors

W-S-610, Type IA,
Style 1.

(b) Outlet boxes

W-J-800a, Type 3,
Size H.

Materials

Specification

(c) Panelboards

W-P-131a(2), Class 1.

(d) Receptacles and plugs

W-C-596, Style A-4.

(2) Conductors. Conductors in buildings shall be copper, of size indicated, color coded; insulation to be of a type to withstand bending at -50 F without damage.

(3) Lighting Fixtures. Conform to Specification 9Yh.

K. Heating and Ventilating Materials and Equipment

(1) Space Heater. Diesel oil fired, gravity type with float control and pot-type burner. It shall have an output of 25,000 Btuh.

(2) Air Intake and Exhaust Blowers. The blowers shall operate on 115 volt, 60 cycle, single-phase current and deliver a minimum of 60 cfm.

(3) Fuel Line. Supply line shall be copper tubing conforming to Specification WW-T-799a, Type K.

(4) Vents and Vent Caps. Joints shall be a snap-lock type, easily assembled and disassembled. All fittings and vent caps shall match vent and be of the same manufacture. Sizes as indicated on the drawings.

3. Fabrication

A. Panels

(1) Frame. All framing members shall be fabricated of one continuous piece (no splice), and lap joint construction shall be used at all corner intersections of framing members. All laminated framing members shall be glued and nailed with 3d zinc-coated nails. All rib joints shall be glued and toe-nailed to the frame with 6d finishing nails in pre-drilled holes of smaller diameter than the nail.

(2) Plywood. All plywood shall be secured to the frame and ribs with glue and 2d zinc-coated nails on 6-inch centers. When panels require widths of plywood greater than 4 feet, a scarf joint shall be used for the splice. Aluminum cladding shall be factory bonded to the plywood.

(3) Insulation. Insulation blankets shall be spot cemented to one face of the panels at four corners and at 12 inches on center along edges.

(4) Joint Gaskets. All bolted joints between panels shall contain a gasket fastened one side only with contact cement. Gasket shall be secured on outer lap of all lap joints and the outer lap side of all corner joints. Bolt holes shall be cut in the gasket after installation on the panel.

(5) Paint. One coat of primer and two coats of enamel shall be applied. All exterior surfaces shall be painted international orange. All interior surfaces shall be painted light green. All aluminum surfaces shall be unpainted. Metal surfaces shall be degreased before painting.

(6) Marking. Panels shall be stenciled for the mark number at the top of each face for wall panels, and at one end each face for roof and other panels.

B. Portable Wainigan Floor

(1) Welding. All welding shall conform to A.W.S. Specifications.

(2) Connectors. All nuts and bolts, except carriage type, bearing on wood shall have flat washers.

(3) Paint. All surfaces shall be painted with one coat of primer and two coats of enamel. Floor panels shall be light green or gray. All other surfaces shall be international orange.

Appendix A

STANDARD SPECIFICATIONS

The standard specifications given in the following list or mentioned in the text shall govern in all cases where references to standard specifications are made. In case of difference between these standard specifications and this specification or its accompanying drawings, this specification or its accompanying drawings shall govern. Especial care shall be exercised to refer in requests for quotations, in orders, and in subcontracts to the standard specifications and to all modifications thereof.

Military

MIL-A-397B	Feb. 3, 1953	Adhesive, room-temperature and intermediate-temperature setting resin (phenol, resorcinol, and melamine base)
MIL-C-3133	Feb. 14, 1950	Cellular rubber products, general purpose (except ebonite)

NAVDOCKS

9Yh	Sept. 1956	Electrical apparatus, distributing systems, and wiring
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Federal

W-C-596	Aug. 19, 1959	Connector, plug, electrical; connector, receptacle, electrical; plate, wall, electrical
W-F-406a	June 9, 1960	Fittings for electrical cable and flexible metal conduit
W-J-800a	Apr. 2, 1958	Junction box; extension, junction box; cover, junction box, (steel, cadmium or zinc-coated)

W-P-131a(2)	Apr. 13, 1951	Panelboards; equipped with automatic circuit-breakers
W-S-610	Apr. 2, 1958	Splice, conductor
FF-B-571a	Jan. 9, 1934	Bolts, nuts, studs, and top rivets (and material for same)
FF-H-116c	July 3, 1957	Hinges, hardware, builder's
FF-N-105	Oct. 6, 1952	Nails, wire; and staples
FF-S-111b	May 15, 1961	Screws, wood
HW-P-530a	Nov. 2, 1961	Plywood; flat panel
QQ-P-416a	Dec. 11, 1956	Plating, cadmium (electro-deposited)
QQ-S-633a	Nov. 6, 1957	Steel bars, carbon, cold finished and hot rolled (general purpose)
QQ-S-640	Aug. 8, 1952	Steel; carbon, sheet and strip
QQ-Z-325a	May 13, 1959	Zinc coating, electro-deposited, requirements for
TT-E-529a	Oct. 30, 1959	Enamel, alkyd, semi-gloss
TT-P-636b	Feb. 23, 1954	Primer coating, synthetic, wood and ferrous metal
WW-T-799a(1)	June 27, 1946	Tubing, copper, seamless (for use with soldered or flared fittings)

Non-Government

All of the following specifications shall be of latest date unless indicated otherwise:

American Society for Testing Materials

Douglas Fir Plywood Association

West Coast Lumbermen's Association Grading Rules No. 15

Appendix B

DRAWINGS FOR THE ICEL WANIGANS

The original of the drawings listed below and shown at reduced scale are available at the U. S. Naval Civil Engineering Laboratory, Port Huonome, California.

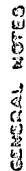
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993670	Standard portable wanigan fabrication requirements
993671	Standard portable wanigan assembly
993672	Extra-wide portable wanigan fabrication requirements
993673	Extra-wide portable wanigan assembly
993674	Standard sled wanigan fabrication requirements
993675	Standard sled wanigan assembly
993676	Extra-wide sled wanigan fabrication requirements
993677	Extra-wide sled wanigan assembly
993678	Standard portable wanigan floor assembly
993679	Standard portable wanigan floor skids and cross members
993680	Standard portable wanigan floor frame, panels, and connectors

Y&D Drawing No.Title

993681	Standard portable wanigan floor tongue
993682	Extra-wide portable wanigan floor assembly
993683	Extra-wide portable wanigan floor skids and cross members
993684	Extra-wide portable wanigan floor frame, panels, and connectors
993685	Extra-wide portable wanigan floor tongue
993686	Standard sled wanigan floor MK-28 and MK-30 panels
993687	Standard sled wanigan floor MK-29 panel
993688	Extra-wide sled wanigan floor MK-1 and MK-3 panels
993689	Extra-wide sled wanigan floor MK-2 panel
993690	Wanigan sidewall MK-4 and MK-6 panels
993691	Wanigan sidewall MK-5 panel
993692	Standard portable wanigan endwall MK-25 and MK-26 panels
993693	Standard portable wanigan endwall MK-27 panel
993694	Extra-wide portable wanigan endwall MK-14 and MK-17 panels
993695	Extra-wide portable wanigan endwall MK-18 panel

WCD DrawingTitle

993696	Standard sled wanigan endwall MK-31 and MK-32 panels
993697	Extra-wide sled wanigan endwall MK-8 and MK-10 panels
993698	Sled wanigan door MK-9 panel
993699	Portable wanigan door MK-20 panel
993700	Portable wanigan door MK-21 panel
993701	Standard wanigan roof MK-22 panel
993702	Standard wanigan roof MK-23 panel
993703	Standard wanigan roof MK-24 panel and MK-7 gusset plate
993704	Extra-wide wanigan roof MK-11 panel
993705	Extra-wide wanigan roof MK-12 panel
993706	Extra-wide wanigan roof MK-13 panel and MK-7 gusset plate
993707	Wanigan accessories heating and ventilating system
993708	Wanigan accessories electrical harness
993709	Wanigan accessories side-mounted fuel tank

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LIST OF DRAWINGS

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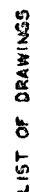


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GENERAL NOTES

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
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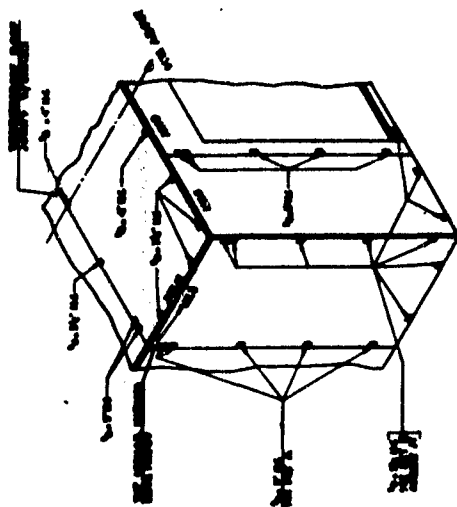
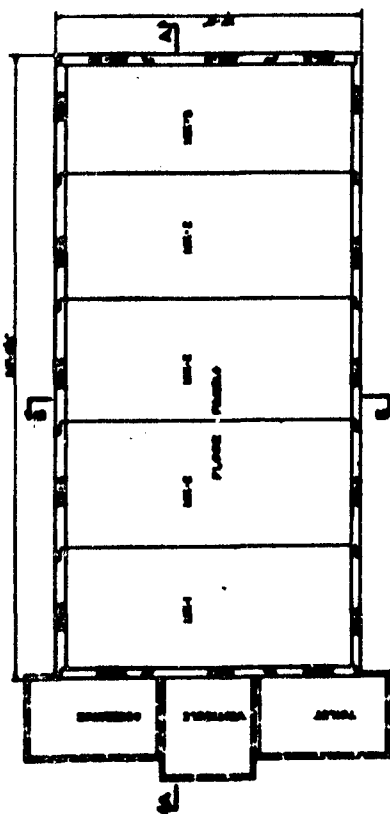


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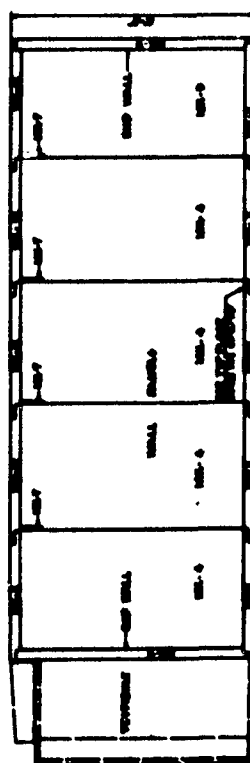
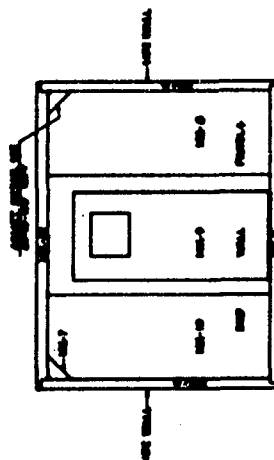
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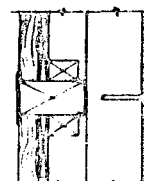
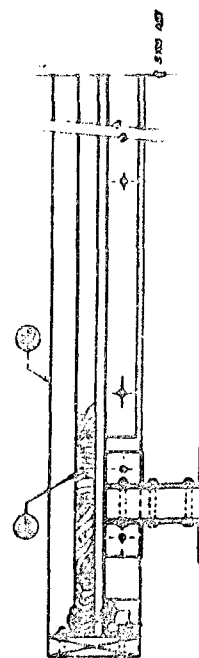
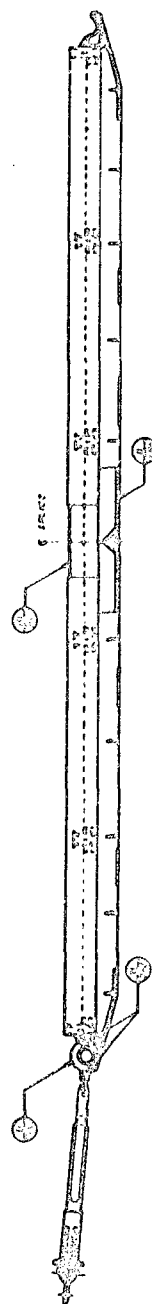
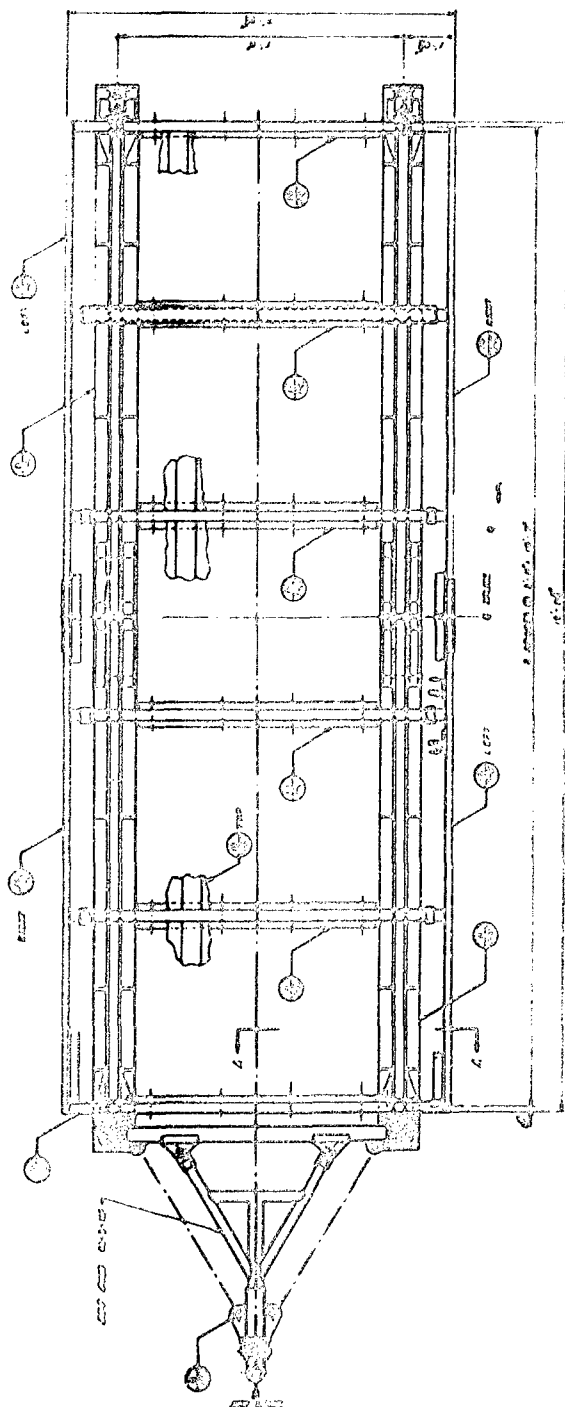
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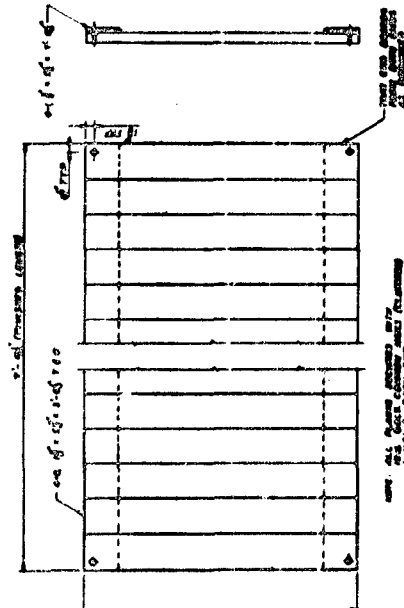
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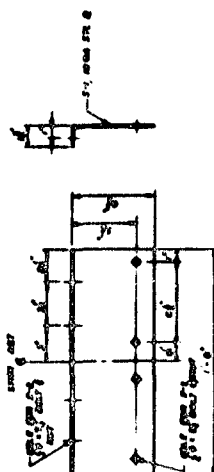
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**STANDARD FURNACE, WARMER, FLOOR
WARMER, RACKS, AND CONVEYERS**

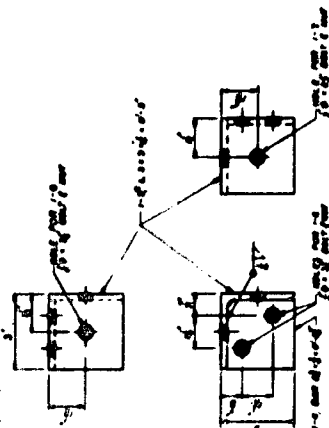
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TYPICAL FLOOR PANEL - 7' x 7' x 1/8"

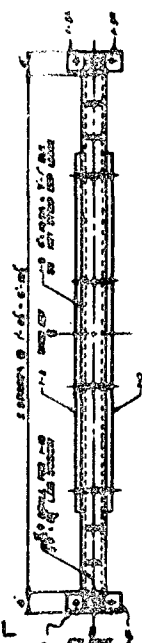
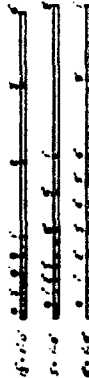


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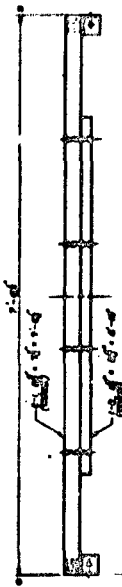


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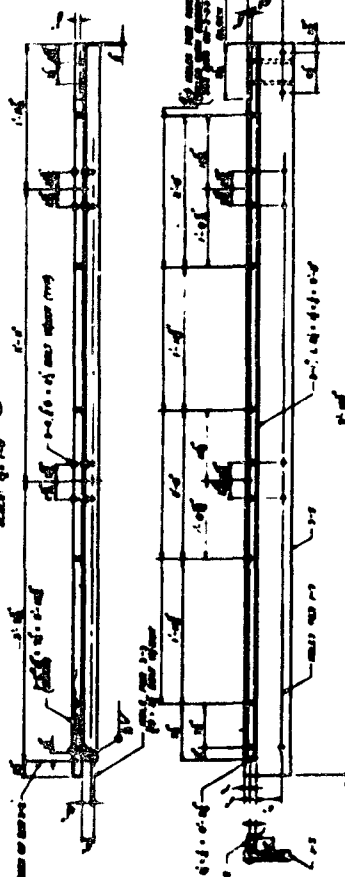
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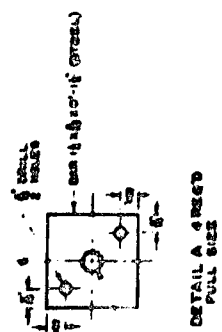
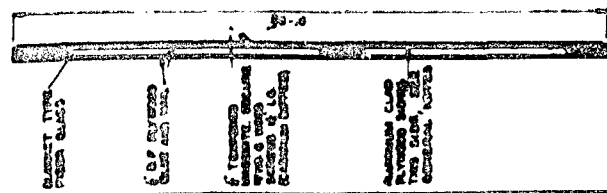
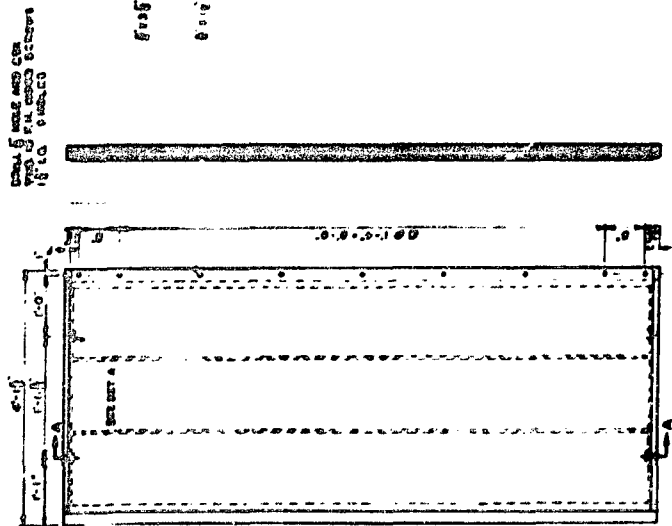
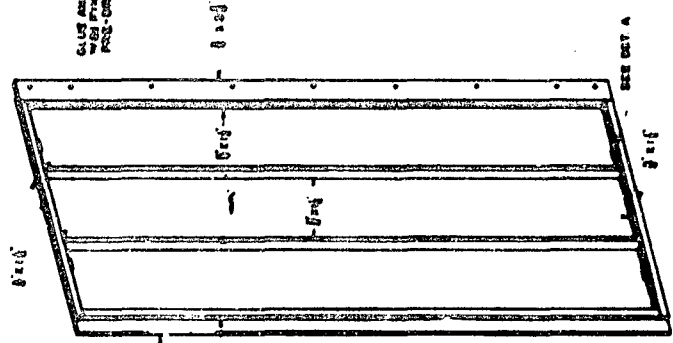
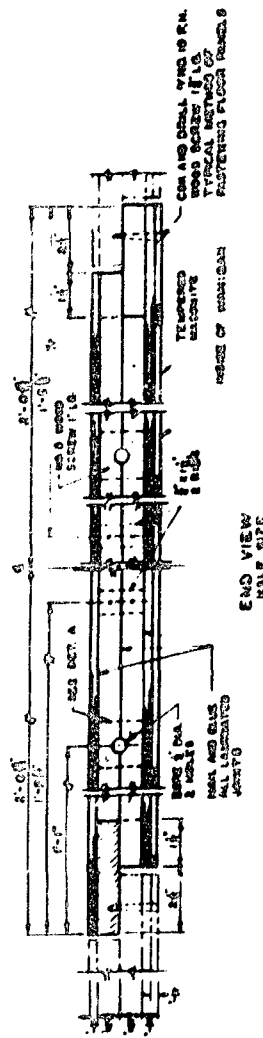
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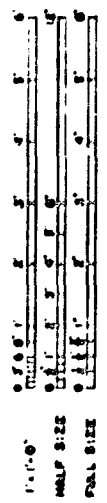
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APPROVED			



NOTES
FOR GENERAL NOTES (LIST OF DIMS. SEE 801070)

ISOMETRIC VIEW
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AND MASONITE COVERING
NOT SHOWN FOR CLARITY
NO SCALE

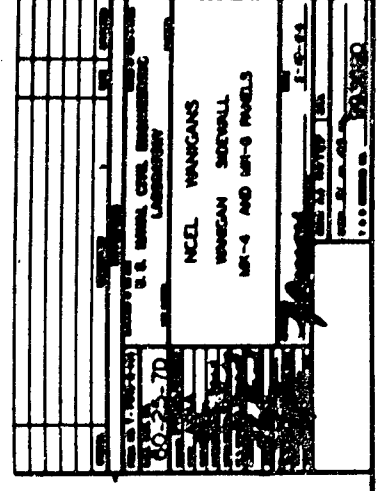
GRAPHIC SCALES



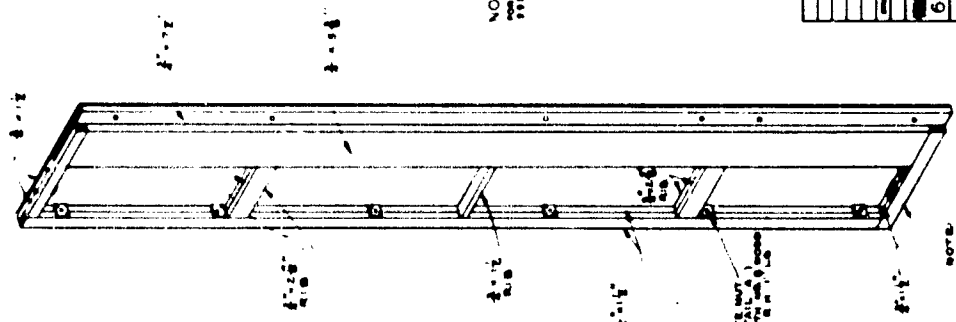
SECTION	NO. 1	DATE	1-1-50
BY	W. H. B. B.	CHECKED	W. H. B. B.
APPROVED			

EXTRA-WIDE SLED WINDOW FLOOR
NO. 2 PANEL

U.S. NATIONAL CIVIL ENGINEERING
LABORATORY
60-25-50

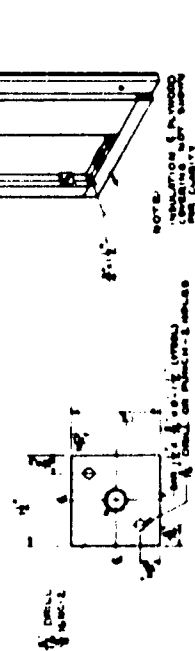


LIST OF MATERIALS	
QTY	DESCRIPTION



NOTES
FOR GENERAL NOTES 4-10" OF DRAWING SEE
551073

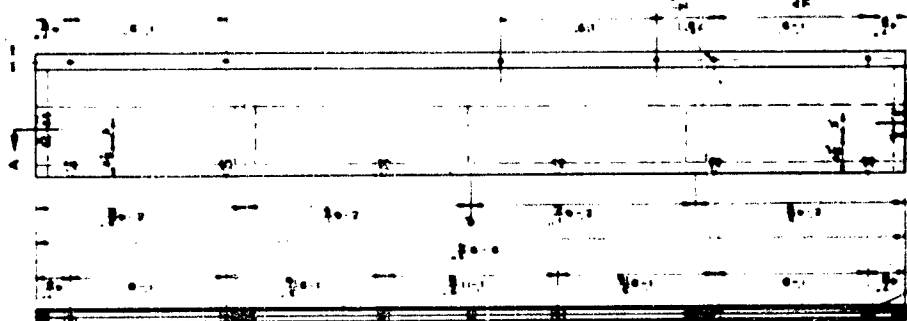
60-25-17D	
U.S. NAVAL CIVIL ENGINEERING LABORATORY	
NCEL MANICANS	
EXTRA-WIDE PORTABLE MANICAN DETAIL	
NK-B PANEL	
DATE	5-18-64
BY	983085



ISOMETRIC VIEW
NO SCALE
GRAPHICAL SCALES



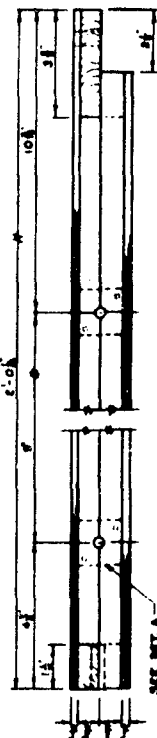
DETAIL A-10 REQ'D
NO SCALE



SECTION A-A
NO SCALE

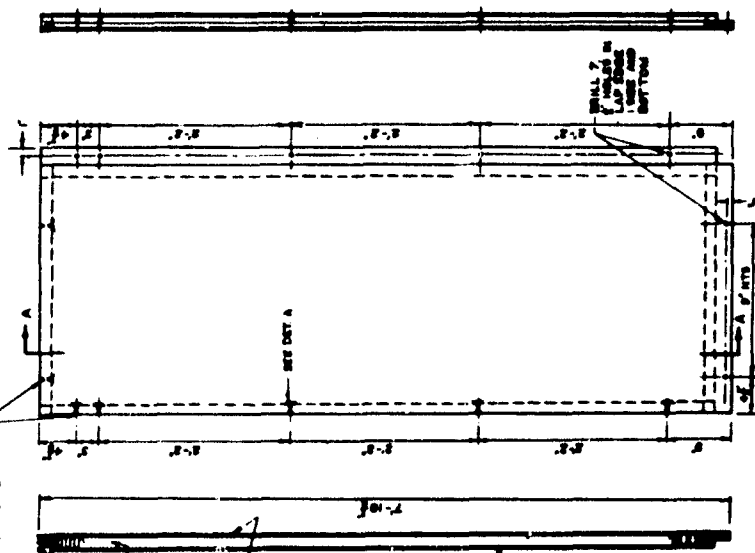
EDGE
ELEVATION
NK IS AS SHOWN
1:10

LIST OF MATERIALS		
ITEM NO.	DESCRIPTION	QUANTITY
1	ALUMINUM CLAP	1
2	BLANKET TYPE PLYWOOD	1
3	GLASS	1
4	INSULATION	1
5	PLYWOOD COVERING	1
6	SCREWS	1
7	DRILL HOLES	1



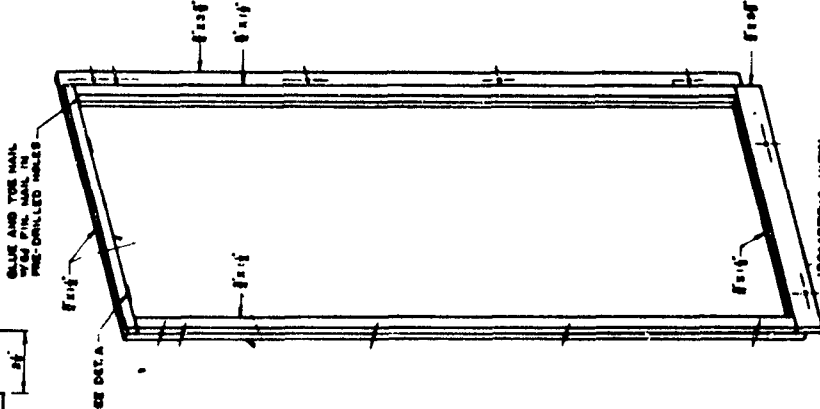
TOP VIEW
HALF SIZE

DRILL 7/8" HOLES IN PANEL
EDGE, 7/8" FROM TOP

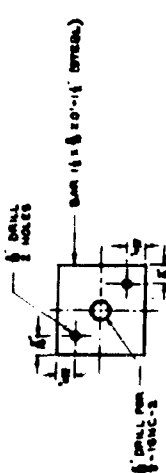


ELEVATION
HALF SIZE

EDGE VIEW



ISOMETRIC VIEW
INSULATION AND PLYWOOD COVERING
NOT SHOWN FOR CLARITY



DETAIL A 7 REQ'D
FULL SIZE

NOTES
FOR GENERAL NOTES (LIST OF NOTES SEE 93070)
NTS DIMENSIONS "NOT TO SCALE"

62-5-50	NOEL WANGSANG	1-8-56
62-5-50	STANDARD BLD WANGSANG DESIGN	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56
62-5-50	10-3 AND 10-32 HOLES	1-8-56

GRAPHIC SCALES



LEWIS AT
MELIA 201

[illegible]

Technical drawing of a window frame assembly. The drawing shows a perspective view of a rectangular frame with a central pane. Dimensions are indicated with arrows and text:

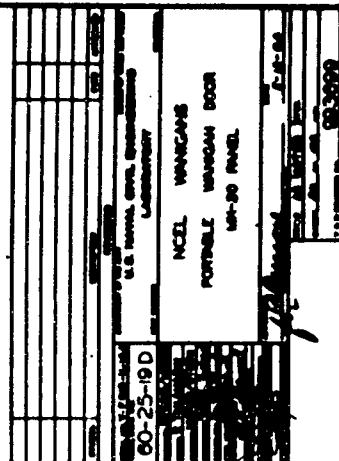
- Top edge: 10 1/2" (overall width)
- Right edge: 5 1/2" (height of the right side panel)
- Bottom edge: 5 1/2" (height of the bottom side panel)
- Left edge: 5 1/2" (height of the left side panel)
- Central pane: 10 1/2" (width) and 5 1/2" (height)

Construction details and labels include:

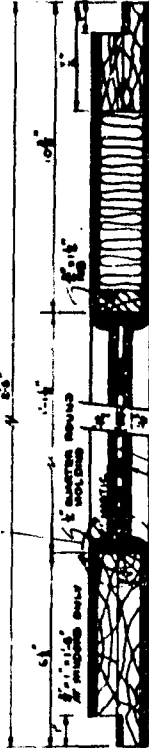
- "GLUE AND THE NAIL WAS PUT IN THE DRILLED HOLES" (pointing to the top-left corner joint)
- "INSULATING VIEW" (pointing to the top-right corner joint)
- "INSULATION AND PLYWOOD COVERING SET BROWN FOR CLARITY" (pointing to the top-right corner joint)
- "5 1/2" (pointing to the bottom-left corner joint)
- "5 1/2" (pointing to the bottom-right corner joint)
- "5 1/2" (pointing to the bottom-left corner joint)
- "5 1/2" (pointing to the bottom-right corner joint)
- "5 1/2" (pointing to the bottom-left corner joint)
- "5 1/2" (pointing to the bottom-right corner joint)

NOTE
FOR GENERAL NOTES & LIST OF NOTES ON SUBJECT

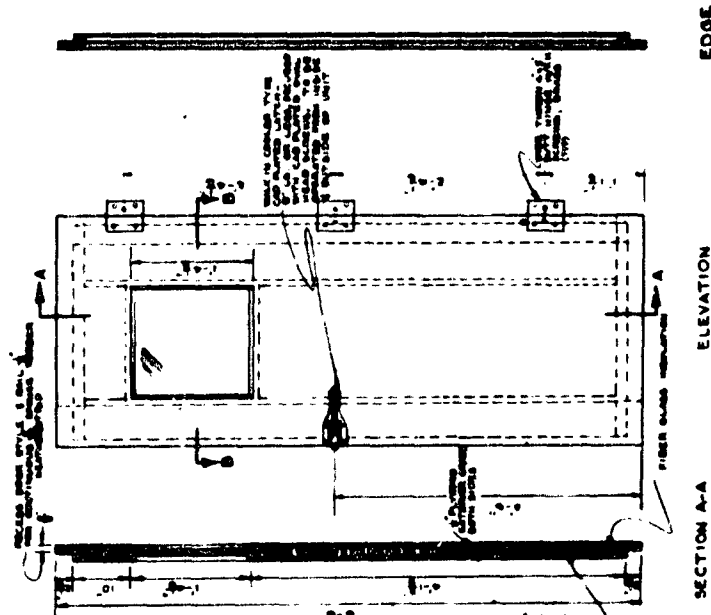
[illegible]



THE DIST. FROM HEAD (SILL OF WINDOW) ---



4 CLEAR ACETIC RINGS
W/OUT IRON SEAL IN
MATIC ALL AROUND

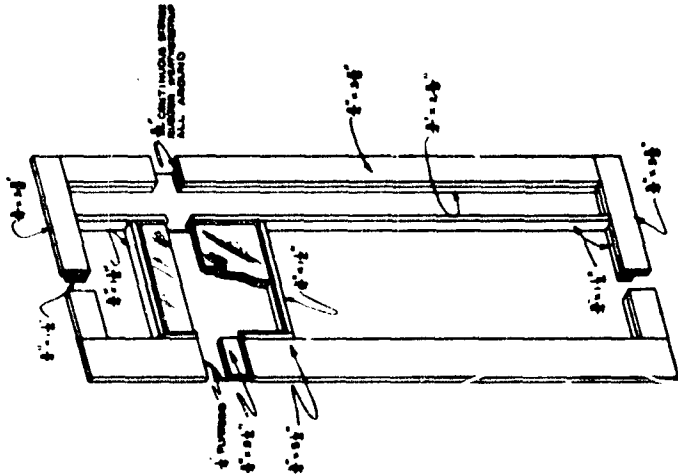


SECTION A-A

ELEVATION

MARK-21 AS SHOWN
18.1'-0"

EDGE



ISOMETRIC VIEW
INSULATION & PLYWOOD CLARITY
COVERING NOT SHOWN FOR
1/8" SCALE

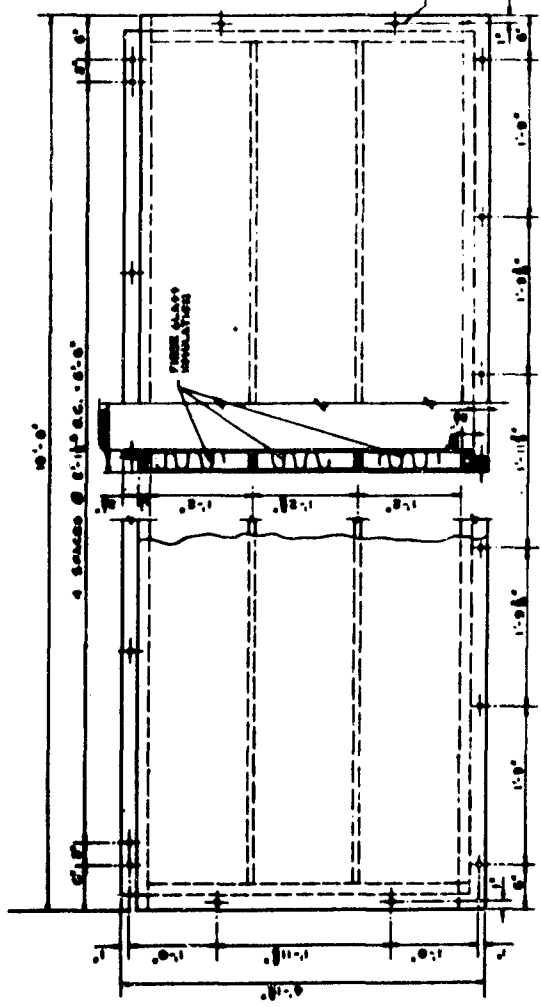


GRAPHIC SCALES

NOTES
FOR GENERAL WORKS (LIT. & SCIENCE) 1917-1918

[illegible]

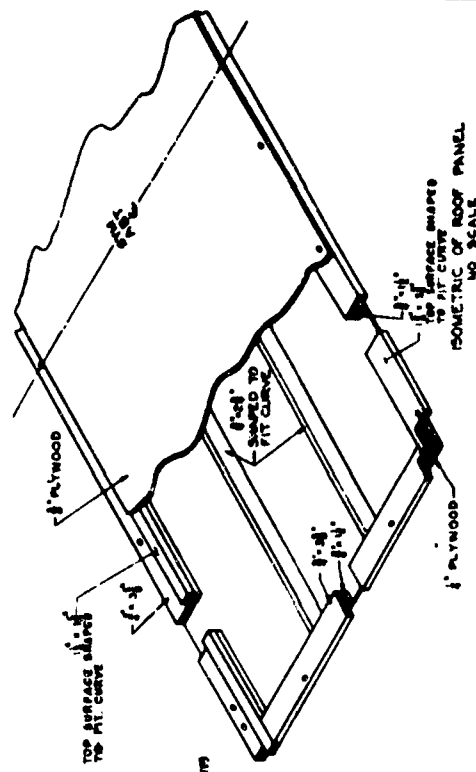
LIST OF MATERIALS	
ITEM NO.	QUANTITY
1	100
2	50
3	25
4	12
5	6
6	3
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
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89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1



PLAN



ELEVATION
MR-11 AS SHOWN
SCALE: 1/8\"/>



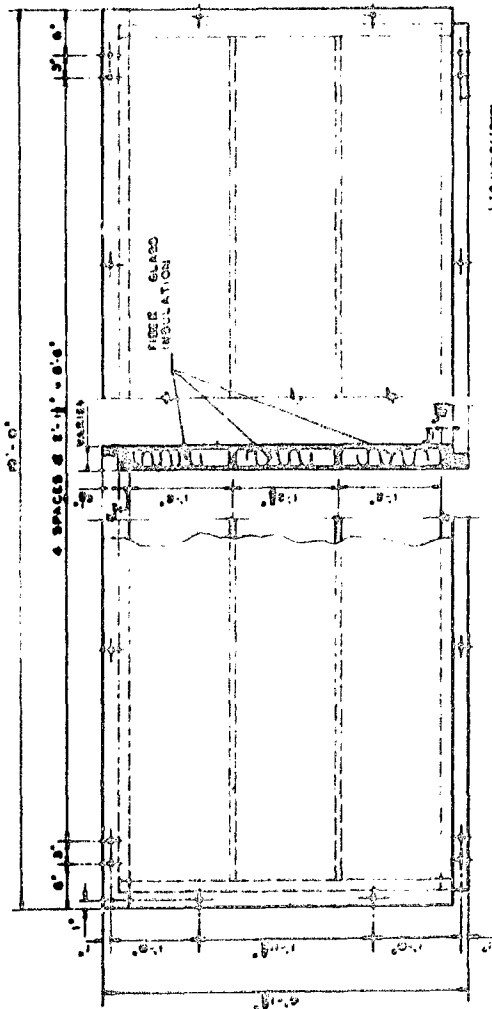
NOTE:
FOR GENERAL NOTES LIST OF PW-4 SEE 030476 OR 000072

GRAPHIC SCALES

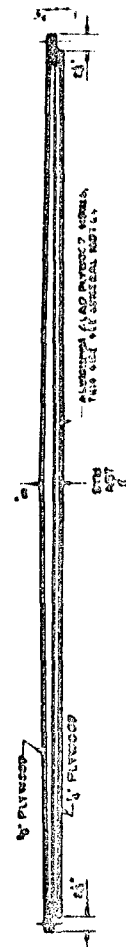


LIST OF MATERIALS	
ITEM NO.	QUANTITY
1	100
2	50
3	25
4	12
5	6
6	3
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
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95	1
96	1
97	1
98	1
99	1
100	1

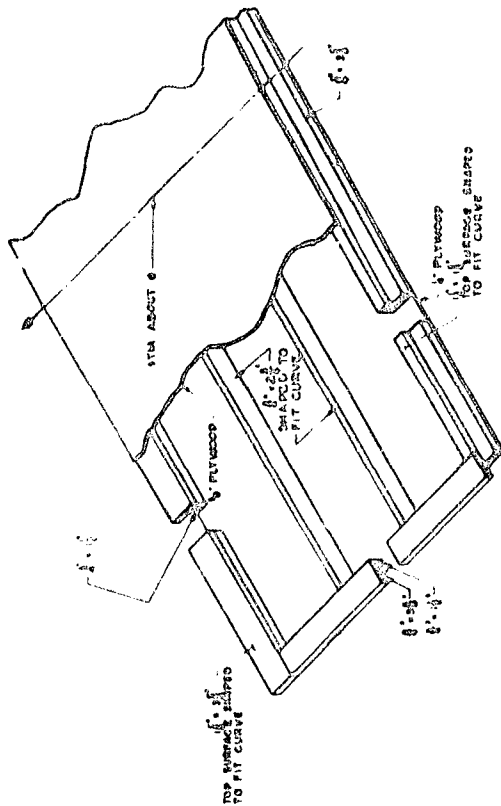
NO. 100	NO. 101	NO. 102	NO. 103	NO. 104	NO. 105	NO. 106	NO. 107	NO. 108	NO. 109	NO. 110	NO. 111	NO. 112	NO. 113	NO. 114	NO. 115	NO. 116	NO. 117	NO. 118	NO. 119	NO. 120
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PLAN



ELEVATION
MADE AS SHOWN
SCALE: 1/4" = 1'-0"



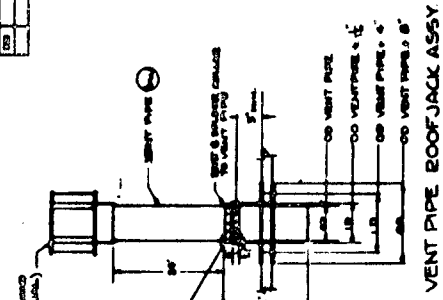
ISOMETRIC OF ROOF PANEL
NO SCALE

NOTE:
FOR GENERAL NOTES & LIST OF DIMS SEE 193578 OF 603572

NO. 100		NO. 101		NO. 102		NO. 103		NO. 104		NO. 105		NO. 106		NO. 107		NO. 108		NO. 109		NO. 110	
NO. 111		NO. 112		NO. 113		NO. 114		NO. 115		NO. 116		NO. 117		NO. 118		NO. 119		NO. 120		NO. 121	
NO. 122		NO. 123		NO. 124		NO. 125		NO. 126		NO. 127		NO. 128		NO. 129		NO. 130		NO. 131		NO. 132	
NO. 133		NO. 134		NO. 135		NO. 136		NO. 137		NO. 138		NO. 139		NO. 140		NO. 141		NO. 142		NO. 143	
NO. 144		NO. 145		NO. 146		NO. 147		NO. 148		NO. 149		NO. 150		NO. 151		NO. 152		NO. 153		NO. 154	
NO. 155		NO. 156		NO. 157		NO. 158		NO. 159		NO. 160		NO. 161		NO. 162		NO. 163		NO. 164		NO. 165	
NO. 166		NO. 167		NO. 168		NO. 169		NO. 170		NO. 171		NO. 172		NO. 173		NO. 174		NO. 175		NO. 176	
NO. 177		NO. 178		NO. 179		NO. 180		NO. 181		NO. 182		NO. 183		NO. 184		NO. 185		NO. 186		NO. 187	
NO. 188		NO. 189		NO. 190		NO. 191		NO. 192		NO. 193		NO. 194		NO. 195		NO. 196		NO. 197		NO. 198	
NO. 199		NO. 200		NO. 201		NO. 202		NO. 203		NO. 204		NO. 205		NO. 206		NO. 207		NO. 208		NO. 209	
NO. 210		NO. 211		NO. 212		NO. 213		NO. 214		NO. 215		NO. 216		NO. 217		NO. 218		NO. 219		NO. 220	

GRAPHIC SCALES

1" = 1'-0" 1/4" = 1'-0"



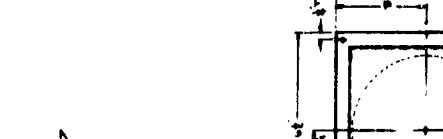
VENT PIPE ROOFJACK ASSY.

NOTES:

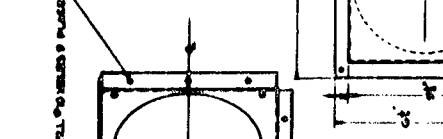
1. DIMENSIONS OF ROOFJACK ARE FOR USE WITH 1/2" DIA. VENT PIPE.
2. VENT PIPE: TOP END LITE, BOTTOM END OF ROOFJACK MUST BE ADJUSTED TO BE PLUMB.



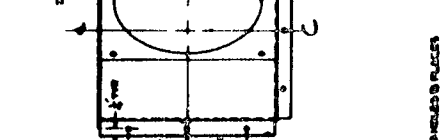
SECTION A-A



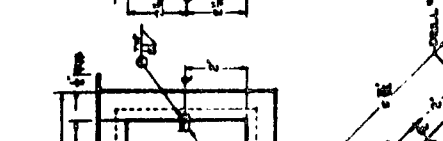
DETAIL OF WEATHER SHIELD



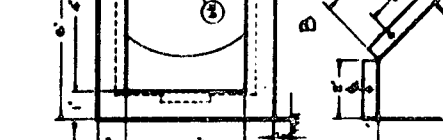
DETAIL OF WEATHER SHIELD



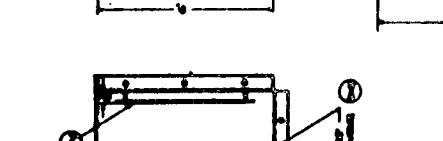
DETAIL OF WEATHER SHIELD



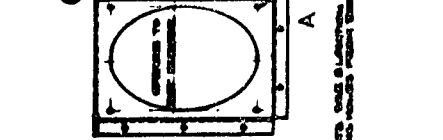
DETAIL OF WEATHER SHIELD



DETAIL OF WEATHER SHIELD



DETAIL OF WEATHER SHIELD

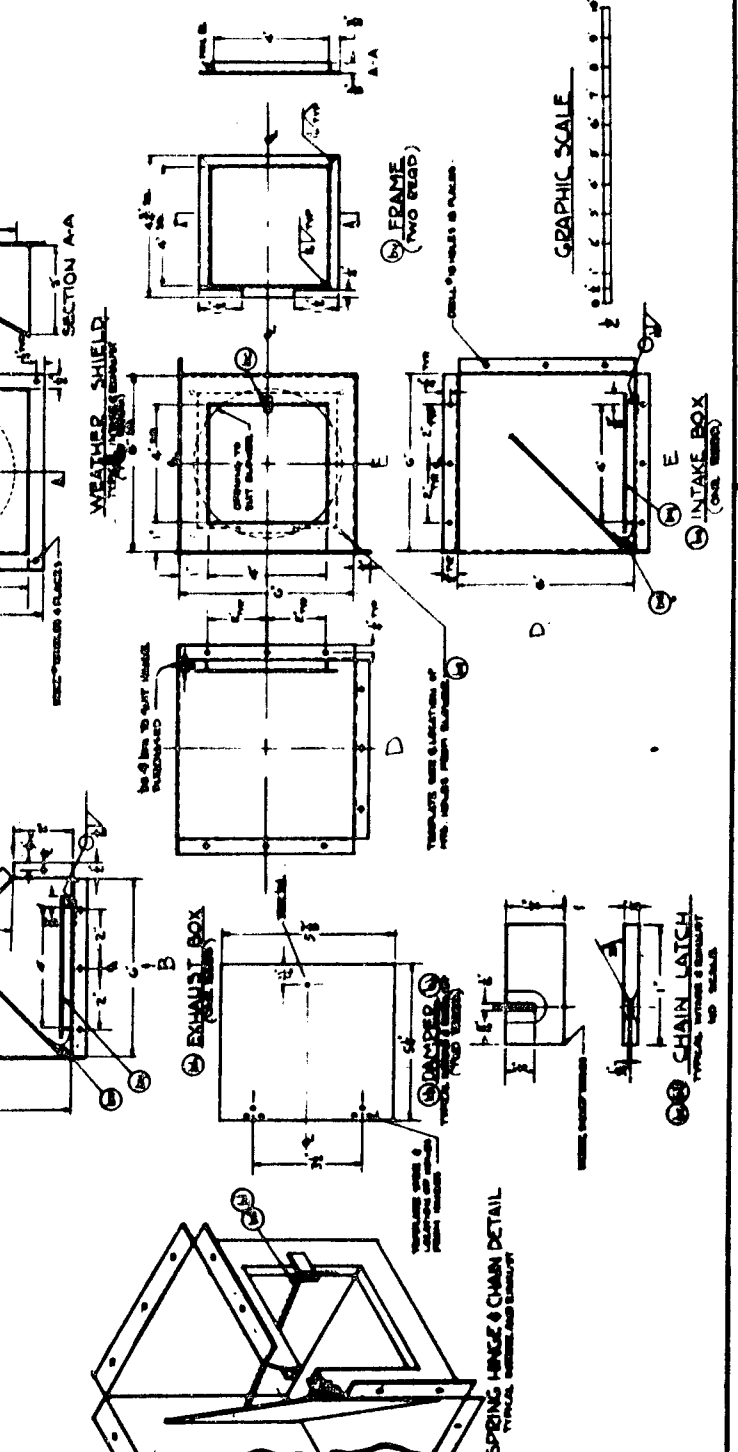


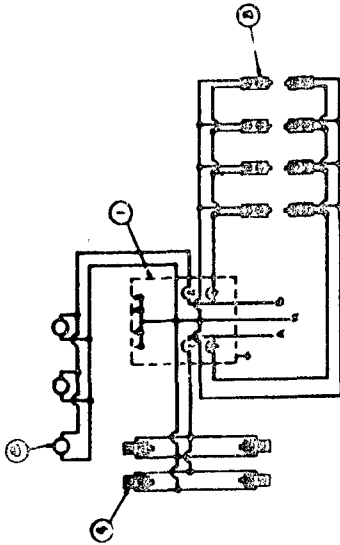
DETAIL OF WEATHER SHIELD



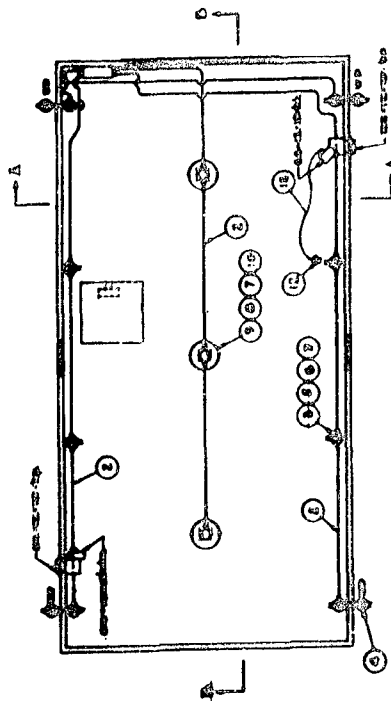
DETAIL OF WEATHER SHIELD

ITEM	DESCRIPTION	QTY	UNIT	REMARKS
1	VENT PIPE ROOFJACK ASSY.	1	EA	
2	WEATHER SHIELD	1	EA	
3	DETAIL OF WEATHER SHIELD	1	EA	
4	DETAIL OF WEATHER SHIELD	1	EA	
5	DETAIL OF WEATHER SHIELD	1	EA	
6	DETAIL OF WEATHER SHIELD	1	EA	
7	DETAIL OF WEATHER SHIELD	1	EA	
8	DETAIL OF WEATHER SHIELD	1	EA	
9	DETAIL OF WEATHER SHIELD	1	EA	
10	DETAIL OF WEATHER SHIELD	1	EA	
11	DETAIL OF WEATHER SHIELD	1	EA	
12	DETAIL OF WEATHER SHIELD	1	EA	
13	DETAIL OF WEATHER SHIELD	1	EA	
14	DETAIL OF WEATHER SHIELD	1	EA	
15	DETAIL OF WEATHER SHIELD	1	EA	
16	DETAIL OF WEATHER SHIELD	1	EA	
17	DETAIL OF WEATHER SHIELD	1	EA	
18	DETAIL OF WEATHER SHIELD	1	EA	
19	DETAIL OF WEATHER SHIELD	1	EA	
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21	DETAIL OF WEATHER SHIELD	1	EA	
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23	DETAIL OF WEATHER SHIELD	1	EA	
24	DETAIL OF WEATHER SHIELD	1	EA	
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100	DETAIL OF WEATHER SHIELD	1	EA	

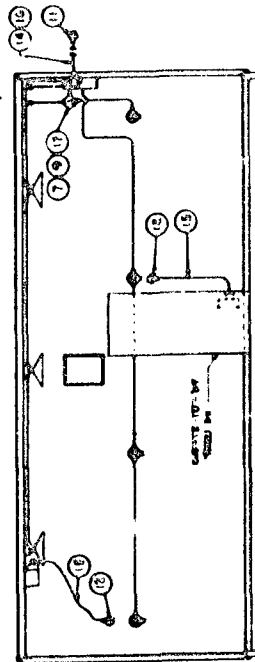




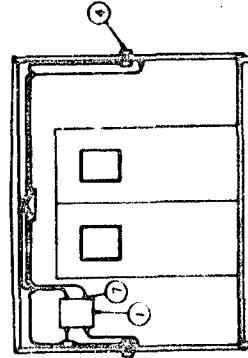
WIRING DIAGRAM



ELECTRICAL PLAN



SECTION B-B



SECTION A-A

GRAPHIC SCALE

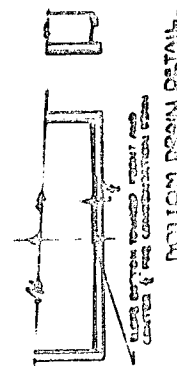
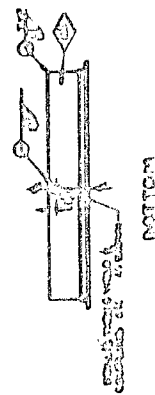
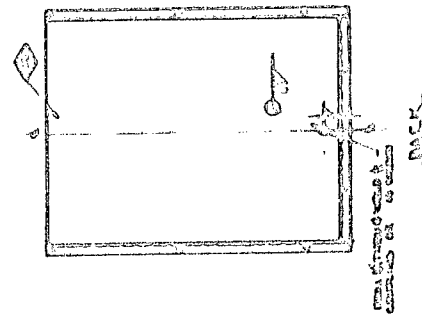
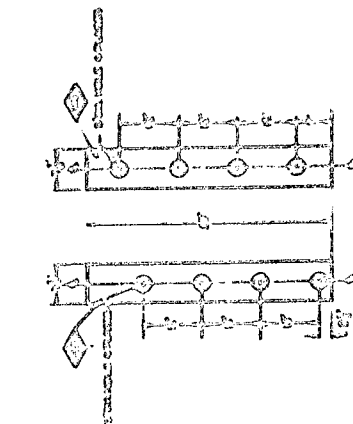
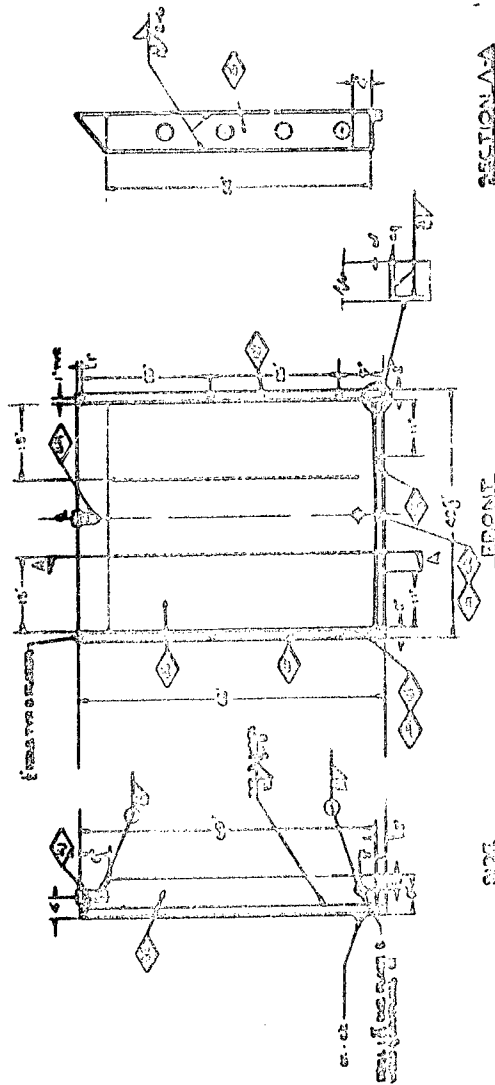
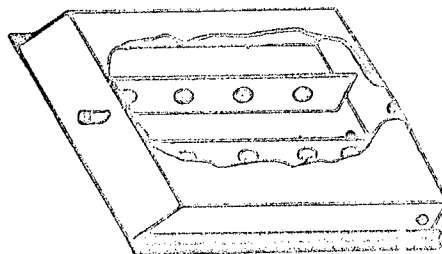


GENERAL NOTES:
 1. ALL ELECTRICAL CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS.
 2. THE EQUIPMENT SHALL BE INSTALLED IN A LOCATION WHERE IT IS PROTECTED FROM PHYSICAL DAMAGE AND WHERE IT IS NOT EXPOSED TO EXCESSIVE HEAT OR MOISTURE.
 3. THE EQUIPMENT SHALL BE INSTALLED IN A LOCATION WHERE IT IS PROTECTED FROM VIBRATION AND SHOCK.
 4. THE EQUIPMENT SHALL BE INSTALLED IN A LOCATION WHERE IT IS PROTECTED FROM CORROSION.
 5. THE EQUIPMENT SHALL BE INSTALLED IN A LOCATION WHERE IT IS PROTECTED FROM OVERHEATING.

NOTE: TO BE USED ONLY WITH THE WIRING AND ELECTRICAL PLAN. THE WIRING AND ELECTRICAL PLAN SHALL BE USED TO DETERMINE THE LOCATION OF THE EQUIPMENT AND THE LOCATION OF THE ELECTRICAL CONNECTIONS.

1	CONDUCTOR - 1/2" DIA. COPPER WIRE
2	CONDUCTOR - 1/4" DIA. COPPER WIRE
3	CONDUCTOR - 1/8" DIA. COPPER WIRE
4	CONDUCTOR - 1/16" DIA. COPPER WIRE
5	CONDUCTOR - 1/32" DIA. COPPER WIRE
6	CONDUCTOR - 1/64" DIA. COPPER WIRE
7	CONDUCTOR - 1/128" DIA. COPPER WIRE
8	CONDUCTOR - 1/256" DIA. COPPER WIRE
9	CONDUCTOR - 1/512" DIA. COPPER WIRE
10	CONDUCTOR - 1/1024" DIA. COPPER WIRE
11	CONDUCTOR - 1/2048" DIA. COPPER WIRE
12	CONDUCTOR - 1/4096" DIA. COPPER WIRE
13	CONDUCTOR - 1/8192" DIA. COPPER WIRE
14	CONDUCTOR - 1/16384" DIA. COPPER WIRE
15	CONDUCTOR - 1/32768" DIA. COPPER WIRE
16	CONDUCTOR - 1/65536" DIA. COPPER WIRE
17	CONDUCTOR - 1/131072" DIA. COPPER WIRE
18	CONDUCTOR - 1/262144" DIA. COPPER WIRE

NCCL WANGS WANGS ACCESSORIES ELECTRICAL HARNESS	
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GENERAL NOTES:

1. The first part of the document is a list of names and addresses, which appears to be a directory or a list of contacts. The names are written in a cursive script, and the addresses are listed below them.

[illegible][illegible]